Claims

1. Magnesium carbonate hydroxyapatite (MgCHA) in which the percentage of carbonation falls within a range of 4 to 10 wt% and which contains a percentage of 5 to 15% of magnesium (expressed as molar percentage with respect to calcium).

2. The MgCHA according to claim 1, in which the molar percentage of magnesium with respect to calcium falls within a range of 6 to 8%.

3. The MgCHA according to claim 2, in which the carbonate is distributed at a rate of 40 to 45% at site A and 60 to 55% at site B.

4. The MgCHA according to claims 1-3, characterized by a nanostructure with a low level of crystallinity, in which the degree of crystallinity is between 40 and 60%.

5. A composite consisting of a hydroxyapatite and an organic polymer, characterized by the fact that the hydroxyapatite is an MgCHA according to claims 1-4, that the polymer is a natural polysaccheride and that these components are mixed according to a method that makes it possible to keep the MgCHA in a solid form.

6. A composite according to claim 5, in which the polysaccheride is a sodium alginate.

7. A composite according to claims 1-6, in which the MgCHA and the alginate are present in proportions from 50:50 to 80:20.

8. A composite according to claim 7, in which the ratio between the MgCHA and the alginate is 60:40.

9. A composite according to claims 5-8 obtained in the form of a porous granulate, which at the moment of therapeutic use is easily convertible to the form of a viscous paste through treatment with aqueous solutions.

10. A composite according to claims 5-8 obtained in a form chosen from the following: gel, malleable paste, malleable putty, sponge, particulate or pre-formed solid that can be moulded according to the application requirements.

11. Process for the synthesis of the MgCHA according to claims 1-4, in which

- a) a phosphoric acid solution and a sodium bicarbonate solution are simultaneously added over a period of between 2 and 8 hours to a suspension of calcium hydroxide and magnesium salt in water at a temperature between 40 and 60 °C,

- b) the resulting mixture is stirred for 1 to 6 hours at a temperature between 30 and 60 °C and is subsequently left to rest at room temperature for 10 to 48 hours,
- c) the MgCHA is separated by centrifugation or filtration, washed and dried in an oven.

12. A synthesis process according to claim 11, in which the magnesium salt is hexahydrated magnesium chloride.

13. A synthesis process according to claim 11, in which the phosphoric acid and the sodium bicarbonate are added over a period of 3 to 5 hours.

14. A synthesis process according to claim 11, in which the reaction temperature is between 35 and 45 °C.

15. A synthesis process according to claim 11, in which the mixture is left to rest at room temperature for a period of 20 to 28 hours.

16. Process for the preparation of the composite according to claims 5-8 in the form of a porous granulate, characterized by an initial dry mixing of the MgCHA and polysaccharide polymer powders in proportions ranging from 50:50 to 80:20, preferably 60:40, and subsequently by mixing in the presence of a solvent on the basis of alcohol or ether and by the complete evaporation of the solvent.

17. A process according to claim 16, in which the solvent is ethyl alcohol or ethyl ether.

18. Compositions containing a composite material according to claim 5.

19. Compositions according to claim 18, in which said composite is in the form of a porous granulate that prior to therapeutic use can be transformed into a dense but easily workable gelatinous paste through treatment with an aqueous solution.

20. Compositions according to claim 18 for the treatment of patients with a loss of bone substance through application of the composite at the level of the bone defect.

21. Compositions according to claim 20, where the bone defect may occur in the fields of orthopaedics or dentistry and may be induced surgically or may occur naturally following a trauma or illness.

22. Compositions according to claim 21, where the bone defect to be treated relates to a dental treatment selected from the following group: increase/reconstruction of tooth sockets, filling of defects following root-end

resection, cystectomy, surgical removal of impacted teeth, filling of the tooth sockets following removal of a tooth in order to maintain the ridge, preparation of an implant bed, stabilization of immediate implants, bone dehiscence.

23. Compositions according to claim 21, where the bone defect to be treated relates to an orthopaedic treatment selected from the following group: maxillofacial surgery, joint reconstruction, repair of fractures, surgical orthopaedic procedures, spinal fusions.

24. Compositions according to claim 18, which together with the composite also contain one or more biologically active agents.

25. Use of the composites according to claim 5 for the preparation of compositions for the treatment of bone defects in the field of dentistry selected from the following group: increase/reconstruction of tooth sockets, filling of defects following root-end resection, cystectomy, surgical removal of impacted teeth, filling of the tooth sockets following removal of a tooth in order to maintain the ridge, preparation of an implant bed, stabilization of immediate implants, bone dehiscence.

26. Use of the composites according to claim 5 for the preparation of compositions for the treatment of bone defects in the field of orthopaedics selected from the following group: maxillofacial surgery, joint reconstruction, repair of fractures, surgical orthopaedic procedures, spinal fusions.

27. Use of the composites according to claim 5 for the preparation of compositions to be used in combination with one or more biologically active agents.

28. Use of the composites according to claim 5 for the preparation of compositions to be used together with various types of implants.